

Allegheny River at Riverside Junction, New York. L. 9 mm., W. 6 mm. *Aplexa hypnorum glabra* DeKay. Pools near Quaker Run at the base of Elko Mountain. L. 15½ mm., W. 8 mm.

VIVIPARIDAE. *Viviparus contectoides* W. G. Binney. From the Allegheny River, just over the state line in Pennsylvania. L. 36 mm., W. 25 mm.

AMNICOLIDAE. *Somatogyrus integer* (Say). Only immature examples found but these were abundant. On stones in the Allegheny River at Bradford Junction.

JAMAICAN LAND SNAILS, 2

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(Plate 2)

The first paper of this series appeared in the July number, pages 6 to 14, in which the symbols used are explained.

Choanopoma triplopoma new species. Figures 6, 12, 13.

Shell (fig. 12) nearest that of *C. fimbriatulum*, but white, usually more depressed and more scabrous; spiral ridgelets (13 visible on penult, 28 on last whorl) narrower and sharper as are also corrugations of relatively broader reflection of peristome; growth riblets fine, but expanded over spiral ridges into delicate, deciduous projections. Alt. (of type male) 12.6 mm., maj. diam. 121 (15.3 mm.), min. diam. 86 (10.8 mm), with 3 whorls remaining. Operculum (fig. 6) almost flat, with about 9 close narrow whorls (like in *fimbriatulum*); calcareous plate consisting of a basal lamella, a high, steeply inclined, inner marginal lamella and a subequal, upper ("reflected") lamella, which is inclined upwards to almost horizontal on penult whorls but is inclined downwards and even fused with basal one near rim of last whorl, and which is decorated on upper surface with very strong, oblique, growth riblets that are higher where they join inner lamella; greatest diam. 5.4 mm.

Type locality (ANSP. 139607): NM2. The calcareous opercular plate in this species shows how that of *C. anomalum* may have arisen by the junction of the rows of cells that secrete the basal and upper lamellae.

C. (Tudorops) redfieldianum magnitesta new subspecies.

Figures 8, 9, 14, 15.

Males (fig. 14) about as large as females of *redfieldianum*; shell with lower, more rounded, growth threads, which are less

undulated by vestigial spirals. Alt. (type female, fig. 15) 19.6 mm., maj. diam. 72 (14.2 mm.), min. diam. 57 (11.2 mm.), with $3\frac{1}{4}$ remaining whorls. Type locality (ANSP. 139608): WV.

C. (*Colobostylus*) *negrilense* new species. Figures 7, 16, 17.

Nearest *C. bronni* (C.B.A.), but last whorl with much finer growth-threads (about 17 to a mm. and averaging 10 to each intervarical space), forming prominent, but more evenly rounded, intervarical crests, which are separated by a wider groove from suture; with umbilical, spiral ridges extending on to base and represented by very weak undulations of the growth-threads (especially varical ones) even on sides of last whorl; outer peristome usually more narrowly but more abruptly reflected; ground color light brownish-yellow to dark brown, with numerous, fine, broken, chestnut spirals (often limited to pre-varical spots) and with one solid band in the umbilicus and two others inside the aperture opposite its attachment. Alt. (type male, fig. 16) 12.4 mm., maj. diam. 81 (10.1 mm.), min. diam. 67 (8.3 mm.), with $3\frac{1}{4}$ remaining whorls.

Type locality (ANSP. 139609): WWC. *C. negrilense* has $2\frac{1}{4}$, almost smooth embryonic whorls (sutural count) and the next whorl develops high, widely spaced, growth riblets and obscure spirals (as in all Jamaican species of *Choanopoma*). The upper calcareous lamella of its operculum (fig. 7) is only as broad as the chondroid plate or the shell aperture (as usual in *Colobostylus* + *Tudorisca*).

***Chondropoma* (*Parachondrella*) *sericinum retreatense* new subspecies.** Figure 18.

Shell like *sericinum*, but with 2 to 3 growth-threads (5 to mm. on last whorl) enlarged and sometimes fused to form irregularly spaced crests at suture; outer peristome with basal half columellar as well as palatal walls expanded into plane of aperture; last whorl with 10 spiral rows of chestnut dashes, one solid band in umbilicus and one inside parietal angle, all showing inside aperture and on peristome; neanic whorls with broad, purplish brown band beginning $\frac{1}{2}$ whorl from apex and extending $2\frac{1}{2}$ whorls. Alt. (type, probably male, fig. 18) 15.6 mm., maj. diam. 55 (8.6 mm.), min. diam. 44 (6.8 mm.), with $7\frac{1}{2}$ whorls (entire). Operculum almost "chondropomoid," with thin calcareous plate almost covering chondroid; growth ribs absent except near beginning of last whorl. Type locality (ANSP. 139610): WWF.

***Poteria varians campeachyi* new species.** Figures 5, 19 to 22.

Shell dwarfed, with epidermis strained rust-red like soil, with

olive tints; growth lines very fine, crossed on last whorl by irregular, spirally impressed lines (type) or with traces of *varians* wrinkles; very variable in shape; basal keel mediocre to indistinct, only demarcated on umbilical side. Alt. (type male, fig. 19) 12.1 mm., maj. diam. 121 (14.6 mm.), min. diam. 101 (12.2 mm.), with 5 whorls (sutural = about $4\frac{1}{2}$). Operculum (fig. 5) with 11 whorls, concave; upper calcareous lamella thin and fragile, usually incomplete on earlier but complete on last two whorls, almost met by turned-up chondroid plate around rim.

Type locality (ANSP. 139611): KCC, near Campeachy Gully, under leaves in ganap zone at base of hills. This coastal race is approached by specimens of *varians* from KHWb; it is also similar to *lacteofluviatilis* (Pils. & Br.), but is usually higher, smaller and with more vestigial *varians* wrinkles.

Fadyenia fadyeniana (C.B.A.), rock-faces [KHW; type seen (broken)]; *F. baquiéana* (Ch.), mainly rock-faces [VCMb, c, d, VF, VW1; compared to worn shells probably from Chitty, which have more than 10 major spirals; first lot intergrades with larger shells which agree with description (2-3 interstitial spirals near periphery) of f. *mitchelliana* (Ch.) and appr. (maj. diam. 2.8 mm.) f. *sutherlandiana* (Ch.)]; *F. alderiana* (Ch.), rock-bases [EJF, shells probably Chitty seen; ENF with specimens approaching *poeyana* (Ch.) except in size]; *F. lindsleyana* (C.B.A.), rock-bases [ML2; type (unique) has $4\frac{1}{8}$ post-embryonic whorls]; paedogenetoid subspecies *jayanum* (C.B.A.), rock-bases, incl. quite typical [MM2-fresh, 3c-young, KHW-slightly appr. next; type has $3\frac{5}{8}$ post-embryonic whorls with nucleus as in *lindsleyana*] and more *Metcalfeia*-like race [KF; looks like description of *newcombiana* (Ch.)]. *Fadyenia*, *Metcalfeia* and *Lindsleya* are combined into a single subgenus, although the first has a longer opercular process than the others (*Lindsleya* + *Metcalfeia*). In this expanded group, the shells are depressed to globose conoid, often with heavy spirals but without epidermal expansions, and cover themselves with calcareous deposit that tends to form two spiral cornices, which are most pronounced in the type species and correspond to its two subangular regions.

Stoastoma pisum C.B.A., under rocks, males smaller than females, including quite typical greenish race [MM3c, 4; Adams'

material seen], one bright orange shell [NM2a] and race intermediate between *pisum* and *livesayanum* Ch. [NMV; shells probably from Chitty seen].

Stoastomops tenuis (C.B.A.), rock-faces, males usually smaller [KC2].

Eutrochatella pulchella (Gray), rock-faces, males usually larger, incl. typical [KHS, KHW], form *grayana* (Pfr.) [KHW, NM2] and appr. *multicarinata* [ENF]; subsp. *scitula* (Wood), rock-faces [M, NMM, NMT, VCMd, VF, VW (but VWS more carinate), WV]; subsp. *cavearum* H.B.B., weak climber [NM2c, NMV]; subsp. *multicarinata* (C.B.A.), weak climber [EJ1-3]; subsp. *cathartensis* H.B.B., under rocks [EEJ]; *E. nobilis* (C.B.A.), rock-faces, males larger, incl. typical [WWC] and race *retreatensis* H.B.B. [WWF]; *E. tankervillei* (Gray), rock-faces, secretive, males usually larger, incl. typical [NMV] and small race [NM2c-dead]; *E. (Excavata) costata* (Swby.), low rock-faces, males usually larger [VCN, near coast].

Prosperina nitida Swby., incl. typical [MM2-4, MN, NM] and mainly race *planulata* C.B.A. [VW2]; *P. linguifera* Pfr., typical [WC1, WWF] and var. *pulchra* C.B.A. [WSF, WC1, WCC]; *P. bidentata* C.B.A. [EEJ, EJ1, 3]; *P. pisum* C.B.A. [VW2]; all these species aestivate under rocks but rapidly climb rock-faces during rains.

Diplopoma? (*Parachondrops*) *campbelli* (C.B.A.), weak rock-climber [WWF; lower parietal region of outer peristome usually cut by deep notches into 3 to 5 spatulate projections]; *D? avenum* (C.B.A.) + *fraterminor* (Pils. & Br.), mainly rock-bases [ML2, MM3, MN1-fresh, MN3a]; *D? shepardianum* (C.B.A.), weak to fair rock-climber, mainly in open [WV, VW2-fresh]. This puzzling little group has a calcareous plate like that in *Rhytidopoma*; it almost completely covers the chondroid whorl and develops high growth-ribs, united medially into a vertical lamella; its radula is of the simpler type like in *Adamsiella*.

Adamsiella (*Adamsiellops*) *ignilabre* (C.B.A.), mainly rock-bases [ML2, MM4, MN3; opercular lamella inclined very steeply upwards and then curving back to parallel convexly and cover $\frac{2}{3}$ to $\frac{3}{4}$ of the chondroid whorl, otherwise unsupported and very fragile].

A. mirabilis (Wood) [VW2-fresh]; *A. irrorata* Gloyne [VCMb, VF; operculum with calcareous lamella almost as extensive as chondroid whorl but very steeply inclined so as to cover little of latter; shell peristome shortly duplex in fully mature shells;] *A. variabilis* (C.B.A.) [MM4, NM2b-fresh; opercular lamella consisting of a rather low vertical region and an inclined upper one, which may cover about half of chondroid whorl; subsp. *granosa* (C.B.A.), including intermediate race [NMM] and typical with f. *errans* (C.B.A.) [MN2, 3]; *A. grayana* (Pfr.) [KC2, KF, KHS, KHW; opercular lamella fairly heavy, steeply and extensively inclined, with narrow upper rim which almost parallels chondroid whorl (like in *Choanopoma hillianum*)]; *A. monstrosa* (C.B.A.), typical [ML1-fresh] and intergrading with f. *intermedia* (C.B.A.) [ML2; opercular lamella similar to that of *variabilis* but with vertical region lower and upper rim steeper and less extensive]; *A. miranda* (C.B.A.) approaching *pearmanaeana* (Ch.) [NM2, 3; type lot of *miranda* is not solute to shortly so; mine are shortly to very solute, either descendingly or tangentially (like in *jarvisi*); opercular lamella inclined very steeply and extensively, upper end in penult whorls with narrow internal rim (like in *Poteria corrugata*) which curves over into a slightly more extensive outer one in last quarter of ultimate whorl]. All these species are fair climbers on rock-faces; the males average considerably smaller than the females.

Choanopoma fimbriatulum (Swby.), weak climber on rocks [MM2-4, MN]; subsp. *docens* (C.B.A.) [NMV, VWS]; subsp. *albinodatum* (C.B.A.) [VF, VW1, 2, WSF]; *C. triplopoma* H.B.B., rock-bases [NM2]; *C. scabriculum* (?) *amabile* (C.B.A.), rock-bases [WSF]; *C. hillianum aculeosum* (C.B.A.) with f. *leporilabre* (C.B.A.), rock-bases [ML1]; *C. lincina* (L.), fair climber on rocks and tree-trunks [KHW]; *C. pisum* (C.B.A.), rock-bases and under [EEJ, EJ1, 3].

C. (Jamaicia) anomalum (C.B.A.), rock-bases [ML2; with shell-sculpture, animal and habits of *Choanopoma*; calcareous plate of its convex operculum single, considerably thickened (but not double) at its median but thinning down to chondroid plate at its lateral edge, with heavy, oblique ribs on its upper

surface, which combine into a weak, vertical lamella at their median ends; *C. (J.) moussonianum* (C.B.A.) has a similarly convex operculum but lateral edge of its calcareous plate is double, although the upper "reflected" and lower lamellae are cemented together throughout most of their width (not sectioned); *C. retrorsum* (C.B.A.), on the other hand, is so close to *C. lima blandianum* (C.B.A.), which is also from Clarendon, that I even doubt their specific separation.]

C. (Tudorops) interruptum (Lam.) [KC1-fresh and young, KCW-subfossil, last whorl with obscure spirals]; *C. banksianum* (Swby.), fair climber [MN4, MN1, 3]; *C. redfieldianum* (C.B.A.), fair climber [VW1, WC, WSF]; subsp. *magnitesta* H.B.B. [WV]; *C. yallahense* (C.B.A.), weak climber [EJF]. In this section of subg. *Colobostylus*, the operculum (figs. 8, 9) is more nearly circular, has more gradually increasing whorls and its upper calcareous lamella overlaps the chondroid plate and the inner peristome of the shell. The opercula of such species as *C. interruptum* and *C. lamellosum* almost intergrade with those of *C. pisum* and *C. retrorsum* (*Choanopoma* s. s.).

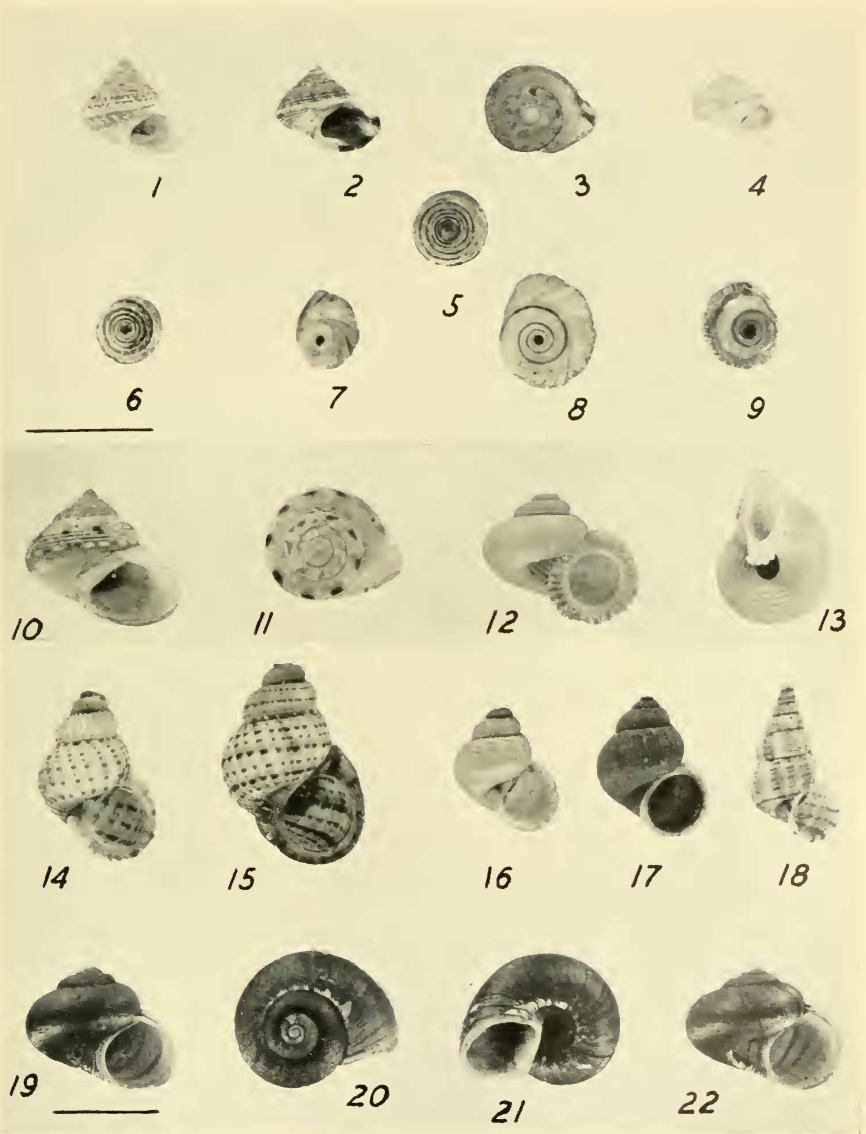
C. (Colobostylus) negrilense H.B.B., fair climber [WWC]; *C. bronni* (C.B.A.), rock-faces and fair climber on trees, including f. *fuscolineatum* (C.B.A.) [VCM] and light form with typical color pattern [VF]; *C. album fuscum* (C.B.A.), but light colored, with prominent spiral malleation [EEC]; *C. chevalieri* (C.B.A.), typical with f. *album* (preoc.) and *virgatum* (C.B.A.), fair climber [VCN]; *C. solidum* (C.B.A.) (+ *jayanum*), subarboreal [MM4, MN]; subsp. *rufilabre* (C.B.A.) [ML1, MM2, 3, MN1]; *C. thysanoraphe* (Swby.) [KHW-fresh]; *C. humphreyanum* (Pfr.), subarboreal [NMV, NMT-dead]. Males smaller than females in all species of *Choanopoma*.

Chondropoma (Parachondria) fascia (Wood), males and females extensively intergrading in size; last calcareous opercular whorl $\frac{2}{3}$ to $\frac{3}{4}$ width of chondroid; subsp. *proximum* (C.B.A.) [KF, EVL-fresh; opercular growth-ribs strong]; subsp. *augustae* (C.B.A.), subarboreal, including *testudineum* (C.B.A.), an intermediate race [ENF; peristome intergrading with both *fascia* and *augustae*; calcareous opercular plate very heavy, with high strong ribs], typical race [EEJ, EJ; calc. operc.

strong and fairly well ribbed in drier habitats, but weak and ribless on last whorl in rich forest, rarely ribless on penult whorl] and app. *nitens* (C.B.A.) [EEC; calc. operc. and ribs strong]. This variation in the calcareous operculum of the type species of *Parachondria* shows that, although a tendency towards rib development may be of systematic (although scarcely sub-family) value, the absence of the ribs and the reduction of the plate itself is of little significance; the usual retention of the ribs on the penult whorl indicates that their absence on the last whorl is not due to wear or erosion.

C. (Parachondrella) fecundum (C.B.A.), fair climber [KC1, 2; last calcareous whorl of operculum heavy, very coarsely ribbed, about $\frac{4}{5}$ width of chondroid]; *C. muticum* (C.B.A.) [KCC-fresh]; *C. armatum* (C.B.A.), fair climber [KC2; last calc. whorl heavy, coarsely ribbed, leaving narrow margin of chondroid exposed]; *C. adamsi* (Pfr.), fair climber [VCN, VCMd-subfossil; last calc. operc. whorl heavy with high thin ribs, about $\frac{2}{3}$ width of chondroid]; *C. columna* (Wood), rock-bases [KHW; last calc. operc. whorl heavy with high thin distant ribs, about $\frac{3}{4}$ width of chondroid]; *C. aurora* (C.B.A.), fair climber [ECC, only found under short stretch of former sea-cliff near mouth of stream; last calc. operc. whorl very thin, $\frac{1}{2}$ to $\frac{2}{3}$ width of chondroid, with weak ribs, usually lacking on last $\frac{1}{3}$ to $\frac{1}{2}$ whorl]; *C. sericinum retreatense* H.B.B., weak rock-climber [WWF]; *C. crenulosum* (C.B.A.), subarbooreal [ML1, NMM-fresh; last calc. operc. whorl thin, only narrowly exposing chondroid, growth-wrinkled but not ribbed (like in *Chondropoma* s. s.); certainly not related to *Choanopoma album* (Swby.)!]. In all these species, the males average smaller than the females.

All the Jamaican species of *Poteria* bury themselves in humus, often near or under rocks, and seldom come to the surface, even during wet weather; the males and females intergrade extensively in size. Their opercula fall into three, none too distinct groups: (1) typical (approached on earlier whorls of other two), with more rapidly increasing whorls, and fairly simple, steeply upcurved lamella, which is weakly (typical) or strongly (*semi-nuda*) buttressed by distinct or confluent growth-ridges; (2) that of *varians*, with narrower whorls and incomplete to complete



1. *Eutrochatella pulchella cavearum*. 2, 3, *E. p. cathartensis*. 4. *Lucidella adamsiana sublaevis*. 5, 19-22. *Poteria varians campeachyi*. 6, 12, 13. *Choanopoma triplopoma*. 7, 16, 17. *C. negrilense*. 8, 9, 14, 15. *C. redfieldianum magnitesta*. 10, 11. *Eutrochatella nobilis retreatensis*. 18. *Chondropoma sericinum retreatense*.